

Patent claims:

1. A process for the coammoximation of at least two ketones which comprises reacting a mixture of at least one cyclic ketone and at least one further ketone with ammonia,
5 hydrogen peroxide, a catalyst which essentially consists of silicon, titanium and oxygen, in the presence of a solvent in one step to give a corresponding mixture of ketone oximes.
2. The process as claimed in claim 1, wherein, in addition, at least one ammonium salt is used as cocatalyst.
- 10 3. The process as claimed in one of the preceding claims, wherein use is made of a mixture of two or more cyclic ketones selected from the group consisting of cyclic ketones having 5 to 20 carbon atoms.
- 15 4. The process as claimed in claim 3, wherein use is made of a mixture of two or more cyclic ketones selected from the group consisting of cyclic ketones having 6 to 12 carbon atoms.
5. The process as claimed in claim 4, wherein, as mixture of cyclic ketones, use is made of a mixture of cyclohexanone and cyclododecanone.
- 20 6. The process as claimed in at least one of the preceding claims, wherein use is made of ammonia at a concentration of at least 20% in water, or pure ammonia.
7. The process as claimed in at least one of the preceding claims, wherein aqueous hydrogen
25 peroxide is used at a concentration of 10-70%.
8. The process as claimed in at least one of the preceding claims, wherein the catalyst used is titanium silicalite.
- 30 9. The process as claimed in one of the preceding claims, wherein, as cocatalyst, use is made of an ammonium salt of a mineral acid and/or of a carboxylic acid.

10. The process as claimed in one of claims 2 to 9, wherein the cocatalyst is generated in the reaction mixture in situ from a Brönsted acid and ammonia.
11. The process as claimed in one of claims 2 to 10, wherein the ammonium salt is present in
5 the reaction mixture at a concentration of 0.001 to 1 mol/kg.
12. The process as claimed in one of the preceding claims, wherein, as solvent, use is made of an at least partially water-miscible solvent, or a water-immiscible solvent.
- 10 13. The process as claimed in claim 12, wherein, when a water-immiscible solvent is used, in addition an interphase contactor is used.
14. The process as claimed in claim 13, wherein, as interphase contactors, use is made of alkanesulfonates and/or quaternary ammonium salts at a concentration of 0.01 to 5% by
15 weight, based on the total reaction mixture.
15. The process as claimed in one of the preceding claims, wherein the reaction temperature is in the range from 20 to 150°C.
- 20 16. The process as claimed in claim 15, wherein the reaction temperature is in the range from 50 to 120°C, preferably in the range from 60 to 100°C.
17. The process as claimed in one of the preceding claims, wherein the coammoximation is carried out in a continuous or in a batchwise reaction system.
- 25 18. The process as claimed in one of the preceding claims, wherein the reaction is carried out at a pressure of 1 to 10 bar.
19. The use of a mixture of cyclic ketone oximes obtained as claimed in claim 1 to 18 for
30 preparing lactams by Beckmann rearrangement.
20. The use as claimed in claim 19, wherein the lactams prepared are selected from the group

consisting of: caprolactam, enantholactam, caprylolactam, pelargonolactam, decanolactam, undecanolactam and lauro lactam.